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10/709,379

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Huan-Sheng Hwang

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EXAMINER

AL NAZER, LEITH A

ART UNIT

PAPER NUMBER

2821

DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/709,379

Applicant(s)

HWANG ET AL.

Examiner

Leith A. Al-Nazer

Art Unit

2821

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-11 and 13-24 is/are rejected.
- 7) ☒ Claim(s) 4 and 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/20/04; 02/16/05.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 2 is objected to because of the following informalities:

In line 6 of claim 2, the word "to" should be inserted after the word "element" in order to form a complete, grammatically correct sentence.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-3, 6, 7, 9, 10, 11, 14, 15, 17, 18, 19, and 21-23 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. patent application publication no. 2004/0242289 to Jellicoe et al.

With respect to claims 1 and 7, Jellicoe teaches an antenna system for a mobile terminal having a movable cover (208), the antenna system comprising a radio frequency interface (106 and 108) to connect the antenna system to the mobile terminal (100; figure 1); a radiating element (104); and a switchable matching arrangement (120)

Art Unit: 2821

disposed between the RF interface (106 and 108) and the radiating element (104), wherein the switchable matching arrangement is operable to switch the antenna system into a first matched condition when the movable cover is in a first position, and into a second matched condition when the movable cover is in a second position (paragraph 0026).

With respect to claim 2, Jellicoe teaches a single matching network (120; paragraph 0022); and a switch (figure 2; paragraph 0026) responsive to the position of the movable cover to connect the single matching network to the radiating element to achieve one of the first matched condition and the second matched condition and to disconnect the single matching network from the radiating element to achieve the other of the first matched condition and the second matched condition.

With respect to claim 3, Jellicoe teaches a first matching network and a second matching network (120 in figure 2; paragraph 0022); and a switch (paragraph 0026) responsive to the position of the movable cover to connect the first matching network to the radiating element to achieve one of the first matched condition and the second matched condition and to connect the second matching network to the radiating element to achieve the other of the first matched condition and the second matched condition.

With respect to claim 6, Jellicoe teaches the radiating element being capable of being extended and collapsed (figures 15-17), wherein the first matched condition and the second matched condition are achieved when the radiating element is extended; and the switchable matching arrangement is further operable to switch the antenna system into a third matched condition when the movable cover is in the first position and

Art Unit: 2821

the radiating element is collapsed, and into a fourth matched condition when the movable cover is in the second position and the radiating element is collapsed (figures 2-11).

With respect to claims 9 and 15, Jellicoe teaches a mobile terminal comprising a movable cover (208); transceiver components (106) operable to transmit and receive communication signals; a processing platform (108) operable to control the transceiver components and to determine when the movable cover is in a first position and a second position; and an antenna system connected to the transceiver components, the antenna system further comprising a radiating element (104) connected to a switchable matching arrangement (120) which is responsive to the processing platform to switch the antenna system into a first matched condition when the movable cover is in the first position, and into a second matched condition when the movable cover is in the second position.

With respect to claim 10, Jellicoe teaches the switchable matching arrangement further comprising a single matching network (120; paragraph 0022); and a switch (figure 2; paragraph 0026) operable to connect the single matching network to the radiating element to achieve one of the first matched condition and the second matched condition and to disconnect the single matching network from the radiating element to achieve the other of the first matched condition and the second matched condition.

With respect to claim 11, Jellicoe teaches the switchable matching arrangement further comprising a first matching network and a second matching network (120 in figure 2; paragraph 0022); and a switch (paragraph 0026) operable to connect the first

Art Unit: 2821

matching network to the radiating element to achieve one of the first matched condition and the second matched condition and to connect the second matching network to the radiating element to achieve the other of the first matched condition and the second matched condition.

With respect to claim 14, Jellicoe teaches the radiating element being extendable and collapsible, wherein the first matched condition and the second matched condition are achieved when the radiating element is extended (figures 15-17); and the switchable matching arrangement being further operable to switch the antenna system into a third matched condition when the movable cover is in the first position and the radiating element is collapsed, and into a fourth matched condition when the movable cover is in the second position and the radiating element is collapsed (figures 2-11).

With respect to claims 17 and 19, Jellicoe teaches a method of operating a mobile terminal having a movable cover (208), the method comprising determining a position of the movable cover, wherein the movable cover is movable between at least a first position and a second position; switching an antenna system comprising a radiating element into a first matching condition when the movable cover is in the first position; switching the antenna system into a second matching condition when the movable cover is in the second position; and engaging in telecommunication signaling through the antenna system (figure 18).

With respect to claim 18, Jellicoe teaches the switching of the antenna system into the first matching condition and the second matching condition being accomplished when the radiating element is in an extended state (figures 15-17), and further

Art Unit: 2821

comprising switching the antenna system into a third matching condition when the movable cover is in the first position and the radiating element is in a collapsed state; and switching the antenna system into a fourth matching condition when the movable cover is in the second position and the radiating element is in the collapsed state (paragraphs 0029-0032).

With respect to claims 21 and 23, Jellicoe teaches a movable terminal comprising a movable cover (208) movable between at least a first position and a second position; an antenna system comprising a radiating element (104); means for determining a position of the movable cover (118); means for switching the antenna system into a first matching condition when the movable cover is in the second position (120); and means for engaging in telecommunication signaling through the antenna system (106 and 108).

With respect to claim 22, Jellicoe teaches means for determining when the radiating element is in an extended state and a collapsed state (1506 and 1512 in figures 15-17); means for switching the antenna system into the first matching condition and the second matching condition when the radiating element is in the extended state (figure 15); means for switching the antenna system into a third matching condition when the movable cover is in the first position and the radiating element is in a collapsed state (120 in figure 2); and means for switching the antenna system into a fourth matching condition when the movable cover is in the second position and the radiating element is in the collapsed state (120 in figure 2).

Art Unit: 2821

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1-3, 5, 6, 7, 9, 10, 11, 13-15, 17-19, and 21-23 are rejected under 35 U.S.C. 102(a) as being anticipated by U.S. patent application publication no. 2003/0096583 to Watanabe.

With respect to claims 1 and 7, Watanabe teaches an antenna system for a mobile terminal having a movable cover (figures 3A-3C), the antenna system comprising a radio frequency interface to connect the antenna system to the mobile terminal (figure 10); a radiating element (1); and a switchable matching arrangement (figures 1, 4, and 5) disposed between the RF interface and the radiating element (1), wherein the switchable matching arrangement is operable to switch the antenna system into a first matched condition when the movable cover is in a first position, and into a second matched condition when the movable cover is in a second position (figures 4 and 5).

With respect to claim 2, Watanabe teaches a single matching network; and a switch responsive to the position of the movable cover to connect the single matching network to the radiating element to achieve one of the first matched condition and the second matched condition and to disconnect the single matching network from the radiating element to achieve the other of the first matched condition and the second matched condition (figures 1, 2, 4, and 5).

With respect to claim 3, Watanabe teaches a first matching network and a second matching network; and a switch responsive to the position of the movable cover to connect the first matching network to the radiating element to achieve one of the first matched condition and the second matched condition and to connect the second matching network to the radiating element to achieve the other of the first matched condition and the second matched condition (figures 1, 2, 4, and 5).

With respect to claim 5, Watanabe teaches an RF connection between the RF interface and the radiating element; a switchable ground connection (5 in figure 4); and a switch responsive to the position of the movable cover to connect the switchable ground connection to the radiating element to achieve one of the first matched condition and the second matched condition and to disconnect the switchable ground connection from the radiating element to achieve the other of the first matched condition and the second matched condition (figures 1, 2, 4, and 5).

With respect to claim 6, Watanabe teaches the radiating element being capable of being extended and collapsed (figures 11A-11C and 12A-12C), wherein the first matched condition and the second matched condition are achieved when the radiating element is extended; and the switchable matching arrangement is further operable to switch the antenna system into a third matched condition when the movable cover is in the first position and the radiating element is collapsed, and into a fourth matched condition when the movable cover is in the second position and the radiating element is collapsed (figures 1, 2, 4, and 5).

Art Unit: 2821

With respect to claims 9 and 15, Watanabe teaches a mobile terminal comprising a movable cover (figures 11A-11C); transceiver components operable to transmit and receive communication signals; a processing platform (52) operable to control the transceiver components and to determine when the movable cover is in a first position and a second position; and an antenna system connected to the transceiver components, the antenna system further comprising a radiating element (1) connected to a switchable matching arrangement (figure 4) which is responsive to the processing platform to switch the antenna system into a first matched condition when the movable cover is in the first position, and into a second matched condition when the movable cover is in the second position.

With respect to claim 10, Watanabe teaches the switchable matching arrangement further comprising a single matching network; and a switch operable to connect the single matching network to the radiating element to achieve one of the first matched condition and the second matched condition and to disconnect the single matching network from the radiating element to achieve the other of the first matched condition and the second matched condition (figures 1, 2, 4, and 5).

With respect to claim 11, Watanabe teaches the switchable matching arrangement further comprising a first matching network and a second matching network; and a switch operable to connect the first matching network to the radiating element to achieve one of the first matched condition and the second matched condition and to connect the second matching network to the radiating element to achieve the

Art Unit: 2821

other of the first matched condition and the second matched condition (figures 1, 2, 4, and 5).

With respect to claim 13, Watanabe teaches an RF connection between the transceiver components and the radiating element; a switchable ground connection (5 in figure 4); and a switch operable to connect the switchable ground connection to the radiating element to achieve one of the first matched condition and the second matched condition and to disconnect the switchable ground connection from the radiating element to achieve the other of the first matched condition and the second matched condition (figures 1, 2, 4, and 5).

With respect to claim 14, Watanabe teaches the radiating element being extendable and collapsible (figures 11A-11C and 12A-12C), wherein the first matched condition and the second matched condition are achieved when the radiating element is extended; and the switchable matching arrangement being further operable to switch the antenna system into a third matched condition when the movable cover is in the first position and the radiating element is collapsed, and into a fourth matched condition when the movable cover is in the second position and the radiating element is collapsed (figures 1, 2, 4, and 5).

With respect to claims 17 and 19, Watanabe teaches a method of operating a mobile terminal having a movable cover (68), the method comprising determining a position of the movable cover, wherein the movable cover is movable between at least a first position and a second position; switching an antenna system comprising a radiating element into a first matching condition when the movable cover is in the first position;

Art Unit: 2821

switching the antenna system into a second matching condition when the movable cover is in the second position; and engaging in telecommunication signaling through the antenna system (figures 1, 2, 4, and 5).

With respect to claim 18, Watanabe teaches the switching of the antenna system into the first matching condition and the second matching condition being accomplished when the radiating element is in an extended state, and further comprising switching the antenna system into a third matching condition when the movable cover is in the first position and the radiating element is in a collapsed state; and switching the antenna system into a fourth matching condition when the movable cover is in the second position and the radiating element is in the collapsed state (figures 1, 2, 4, and 5).

With respect to claims 21 and 23, Watanabe teaches a movable terminal comprising a movable cover (68) movable between at least a first position and a second position; an antenna system comprising a radiating element (1); means for determining a position of the movable cover (52 and 53); means for switching the antenna system into a first matching condition when the movable cover is in the second position (52); and means for engaging in telecommunication signaling through the antenna system.

With respect to claim 22, Watanabe teaches means for determining when the radiating element is in an extended state and a collapsed state (53); means for switching the antenna system into the first matching condition and the second matching condition when the radiating element is in the extended state; means for switching the antenna system into a third matching condition when the movable cover is in the first position and the radiating element is in a collapsed state; and means for switching the

Art Unit: 2821

antenna system into a fourth matching condition when the movable cover is in the second position and the radiating element is in the collapsed state (figures 1, 2, 4, and 5).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 8, 16, 20, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent application publication no. 2004/0242289 to Jellicoe et al. in view of U.S. patent application publication no. 2003/0216150 to Ueda.

Claims 8, 16, 20, and 24 require the first matched condition and the second matched condition be achieved when the mobile terminal is operating in one frequency band; and the switchable matching arrangement is further operable to switch the

Art Unit: 2821

antenna system into a third matched condition when the movable cover is in the first position and the mobile terminal is operating in another frequency band, and into a fourth matched condition when the movable cover is in the second position and the mobile terminal is operating in the other frequency band. Such a configuration is known in the art, as is evidenced by Ueda (19; figure 2). Therefore, at the time of the invention, it would have been obvious to one having ordinary skill in the art to utilize a switchable matching arrangement based on the operating frequency and cover configuration as detailed above in the system of Jellicoe. The motivation for doing so would have been to provide multiple frequency bands on which to operate, and in the process, reducing noise and interference.

9. Claim 8, 16, 20, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent application publication no. 2003/0096583 to Watanabe in view of U.S. patent application publication no. 2003/0216150 to Ueda.

Claims 8, 16, 20, and 24 require the first matched condition and the second matched condition be achieved when the mobile terminal is operating in one frequency band; and the switchable matching arrangement is further operable to switch the antenna system into a third matched condition when the movable cover is in the first position and the mobile terminal is operating in another frequency band, and into a fourth matched condition when the movable cover is in the second position and the mobile terminal is operating in the other frequency band. Such a configuration is known in the art, as is evidenced by Ueda (19; figure 2). Therefore, at the time of the

Art Unit: 2821

invention, it would have been obvious to one having ordinary skill in the art to utilize a switchable matching arrangement based on the operating frequency and cover configuration as detailed above in the system of Watanabe. The motivation for doing so would have been to provide multiple frequency bands on which to operate, and in the process, reducing noise and interference.

Allowable Subject Matter

10. Claims 4 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to teach or suggest one or more of the limitations found in independent claims 4 and 12. With respect to claims 4 and 12, the prior art of record fails to teach or suggest the switchable matching arrangement comprising a first feed point and a second feed point.

Citation of Pertinent References

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patent documents further show the state of the art with respect to impedance matching circuits in foldable cell phone configurations:

- a. European patent application publication 0 518 526 A1 to Tamura

The following patent documents further show the state of the art with respect to impedance matching circuits in devices with a retractable antenna system:

- b. U.S. patent no. 5,923,297 to Kim et al.

The following patent documents further show the state of the art with respect to impedance matching circuits with a switchable ground configuration in a communication device with a reconfigurable housing:

- c. UK patent application publication 2 389 463 A to Kurihara
- d. International application publication WO 96/37967 to Eaton et al.

The following patent documents further show the state of the art with respect to switchable antenna-feed configurations comprising at least two feed points:

- e. U.S. patent no. 6,624,795 to Boyle
- f. U.S. patent no. 5,374,937 to Tsunekawa et al.


Communication Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leith A. Al-Nazer whose telephone number is 571-272-1938. The examiner can normally be reached on Monday-Friday, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 571-272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LA


WILSON LEE
PRIMARY EXAMINER